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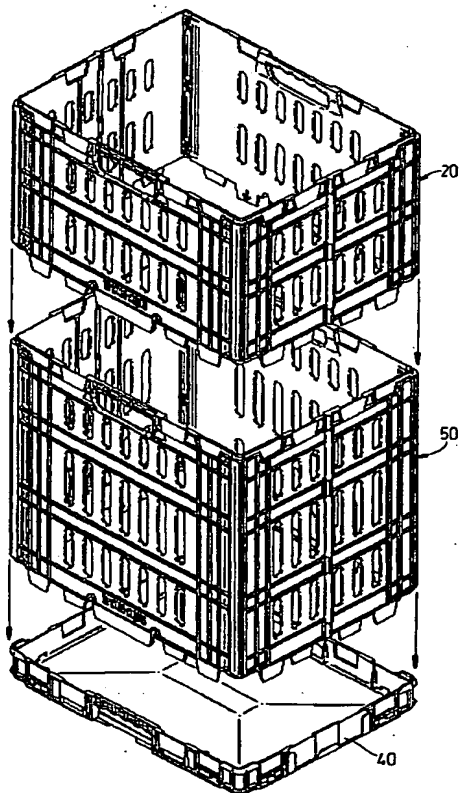
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[Continued on next page]

(54) Title: **ENCLOSURE ASSEMBLY**



(57) Abstract: An enclosure assembly (1), and method of assembling transportation packaging therefrom, which is adapted to be supported on a container (2) and in situ the enclosure assembly encloses a region above the container, said enclosure assembly comprising co-operable attachment means (3, 7), the arrangement of the enclosure assembly being such that in use the attachment means of a first enclosure assembly which is supported on a container is engaged with the attachment means of a second enclosure assembly, said enclosure assemblies forming a stack in which the second enclosure assembly encloses a region above the first enclosure assembly. Advantageously, the enclosure assemblies can be stacked together to form a substantially rigid structure above the container according to the height of the goods in the container.



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## ENCLOSURE ASSEMBLY

The present invention relates to enclosure assemblies and in particular to enclosure assemblies which are adapted to be supported on a container and in situ the enclosure assembly encloses a region above the container.

- 5 According to a first aspect of the invention there is provided an enclosure assembly which is adapted to be supported on a container and in situ the enclosure assembly encloses a region above the container, said enclosure assembly comprising co-operable attachment means, the arrangement of the enclosure assembly being such that in use the attachment means of a
- 10 first enclosure assembly which is supported on a container is engaged with the attachment means of a second enclosure assembly, said enclosure assemblies forming a stack in which the second enclosure assembly encloses a region above the first enclosure assembly.

- Preferably the enclosure assembly is of substantially tubular form and the
- 15 distal ends of which are open.

Preferably the attachment means comprises first attachment means and second attachment means, the first attachment means being spaced from the second attachment means in the direction of the height of the enclosure assembly.

- 20 The first attachment means and the second attachment means are desirably located towards respective distal ends of the enclosure assembly.

In one preferred embodiment the first attachment means is located towards a lowermost margin of the enclosure assembly and the second attachment means is located towards an uppermost margin of the enclosure assembly.

- 5 The uppermost margin of the enclosure assembly may be adapted to provide mounting for lid means.

Preferably the first attachment means of one enclosure assembly is adapted to be engaged with the second attachment means of another enclosure assembly.

- 10 Preferably engagement between the first attachment means of one enclosure assembly and second attachment means of another enclosure is by way of a male-to-female arrangement.

- Preferably the first attachment means is adapted to engage with a container so that the enclosure assembly is secured to the container to  
15 enclose a region above said container.

The protrusion means desirably comprises a portion which extends generally laterally of the enclosure assembly and which portion is adapted to be received by complementary protrusion receiving means.

Preferably the first attachment means comprises protrusion means.

- 20 Preferably the second attachment means comprises protrusion receiving means.

Although in one preferred embodiment the first attachment means comprises a feature which is adapted to engage with either of a container or the second attachment means of another enclosure assembly, the first attachment means may comprise the (physically distinct features of) container attachment means and enclosure assembly attachment means. So, for example, a lowermost margin of an enclosure assembly may be provided at least one protrusion which is adapted to engage with a recess in a side wall of a container and at least one other protrusion which is adapted for engagement with a recess on a side wall of another enclosure assembly.

In a preferred embodiment of the invention there is provided an enclosure assembly which is adapted to be supported on a container and in situ the enclosure assembly encloses a region above the container, the enclosure assembly comprising protrusion means which is co-operable with a receiving means provided in a side wall of the container and the arrangement being such that in use the protrusion means is adapted to extend generally outwardly of the container and into the receiving means so as to secure the enclosure assembly to the container.

The first attachment means preferably comprises protrusion means which is provided secured to a resilient portion. The resilient portion desirably extends generally downwards of the enclosure assembly. The resilient portion is adapted to be deflectable in a direction which is generally lateral of the enclosure assembly.

Preferably where the enclosure is of oblong-rectangular shape, protrusion means are provided on opposite sides of the enclosure assembly.

The protrusion means is preferably of a tapered profile. The tapered profile most preferably widens laterally of the enclosure assembly with increasing height.

According to a second aspect of the invention there is provided a method  
5 of assembling transportation packaging comprising attaching a first enclosure assembly onto a container by way of engagement between first attachment means of the first enclosure assembly and the container such that the first enclosure assembly encloses a region above the container, and attaching a second enclosure assembly to the first enclosure assembly  
10 by way of engagement between first attachment means of the second assembly and second attachment means of the first enclosure assembly such that the second enclosure assembly encloses a region above the first enclosure assembly, each enclosure assembly being of substantially tubular form and the distal ends of the first assembly, and that distal end  
15 of the second enclosure assembly which, in situ, is adjacent to a distal end of the first enclosure assembly, being open.

Preferred embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

20 **Figure 1** is a side elevation of an enclosure assembly being attached to a container;

**Figure 2** is an end elevation of the enclosure assembly and container shown in the condition in **Figure 1**;

25 **Figure 3** is a side elevation of the enclosure assembly and container shown in **Figures 1** and **2** in which the enclosure assembly is attached to the container.

Figure 4 is an end elevation of the enclosure assembly and container shown in the condition in Figure 3;

Figure 5 shows a side elevation of two enclosure assemblies being stacked and attached to a container;

5      Figure 6 shows an end view of the two enclosure assemblies and the container in the condition shown in Figure 5;

Figure 7 shows a side elevation of the two enclosure assemblies and the container in a assembled condition;

10      Figure 8 shows an end elevation of the two enclosure assemblies and the container in the condition shown in Figure 7;

Figure 9 shows a side elevation of a stack of two enclosure assemblies and two containers;

Figure 10 shows an end elevation of the arrangement shown in Figure 9;

15      Figure 11 is a plan view of an enclosure assembly;

Figure 12 is a plan view of the enclosure assembly shown in Figure 11 in a semi-collapsed condition;

Figure 13 is a plan view of three enclosure assemblies of the kind shown in Figures 11 and 12 in a fully collapsed condition;

20      Figure 14 is a partial vertical cross-sectional view of a tongue of an enclosure assembly being urged towards a receiving aperture of a container;

Figure 15 shows a partial vertical cross-sectional view of the tongue of an enclosure assembly in situ in an aperture of a container;

Figure 16 shows a perspective view of a second embodiment of the invention;

5      Figure 17 shows a more detailed view of a resilient tongue of in the assembly shown in Figure 16;

Figure 18 shows a more detailed view of the outside of a handle of the assembly shown in figure 16;

10      Figure 19 shows a more detailed view of the inside of a handle of the assembly as shown in Figure 16;

Figure 20 Shows a perspective view of the assembly shown in Figure 16 in a semi-collapsed condition;

Figure 21 shows a perspective view of a tray for use with the assembly shown in Figure 16;

15      Figure 22 shows a perspective view of two enclosure assemblies of the type shown in Figure 16 and the tray shown in Figure 21, and;

Figure 23 is a detailed view of the enclosure assemblies of Figure 22 in an attached condition.

20      With reference to Figures 1 and 2, an enclosure assembly 1 is shown being attached to a container 2 of tray form.

The enclosure assembly 1 is of oblong-rectangular shape and comprises two side walls 12 and two end walls 13. The inwardly facing surfaces of



the lower margins of walls 13 are each provided with a resilient limb 4 attached to which are two tongues 3. The tongues 3 are located at the lower edge of the limb and are spaced apart by a distance corresponding to the spacing between two apertures provided in end walls 15 of the container. As best seen in Figure 1 the tongues 3 are of tapered profile and widen outwardly of the enclosure assembly with increasing height.

The upper margin of each of the walls 13 is provided with two oblong-rectangular apertures 7. The spacing and size of the apertures 7 corresponds substantially to the spacing and size of the tongues 3.

10 Each of the walls 12 and 13 is provided with a plurality of vertical ventilation slots 5.

The container 2 is of oblong-rectangular shape and comprises two end walls 15 and two side walls 16. A rim 6 extends around the upper margin of the container. Each of the end walls 15 is provided with the two apertures 8 below the rim 6. The apertures 8 being of substantially the same size and spacing as apertures 7.

The enclosure assembly 1 is used as follows. The enclosure assembly is positioned above the container 2 with the tongues 3 being held directly above corresponding apertures 8. As the enclosure assembly is urged towards the container 2, the tongues 3 engage with the inner surface of the end walls 15 and in so doing the limbs 4 are deformed inwardly of the container, as best seen in Figure 14. With reference in particular to Figure 15 continued downward urging of the enclosure assembly results in the tongues 3 snapping into the recesses 8 so as to attach the enclosure assembly 1 to the container 2. In such an attached condition the enclosure assembly is supported on the container by way of lower surfaces 16 of the walls 13 bearing on upper surfaces 17 of the walls 15.

The enclosure assembly is thus prevented from upward movement relative to the container as a result of the location of the tongues 3 in respective apertures 8. In order to remove the enclosure assembly from the container a user needs simply to depress each tongue inwardly of the enclosure assembly and lift the assembly 1 clear of the container 2.

Figures 5, 6, 7 and 8 show how co-operation between the tongues 3b of an enclosure assembly 1b and apertures 7a of an enclosure assembly 1a enables two enclosure assemblies to be attached together to form a stack. The enclosure assemblies 1a and 1b are identical to the enclosure assembly 1. Initially enclosure assembly 1a is attached to the container 2 as described above. The enclosure assembly 1b is then positioned above the enclosure assembly 1a and urged downwardly so that tongues 3b are received by respective apertures 7a. Such a stacked arrangement is particularly advantageous when the container holds tall goods, such as plants, the height of which is greater than that of an enclosure assembly, in which case a second enclosure assembly is attached onto a first enclosure assembly. Thus advantageously the same mechanism is used to attach an enclosure assembly to a container as to attach an enclosure assembly to another enclosure assembly.

Advantageously the stacked enclosure assemblies form a substantially rigid structure the height of which can be chosen in accordance with the height of the goods to be transported.

Figures 9 and 10 show two enclosure assemblies 1c and 1d which are identical to enclosure assembly 1 but for the addition of two support members 9c and 9d on each of the inwardly facing surface of walls 13c and 13d respectively. The support members 9c allow an enclosure assembly 1d attached to a container 2d can be stacked onto an enclosure assembly 1c attached to a container 2c, as is convenient for

transportation. The support members 9d provided on the enclosure assembly 1d are used to support a lid 10.

Figures 11, 12 and 13 show how the walls of the enclosure assembly 1 are attached by way of four hinges at the corners of the assembly so as to  
5 allow the assembly to be readily collapsible.

It will be appreciated that two opposite walls of any of the enclosure assemblies described above may be provided with handle means, for example two elongate apertures, so that the enclosure assembly and the container to which it is attached may be lifted. In any case, the co-  
10 operation of the tongues 3 and the apertures 7 and 8 is sufficient to allow both the enclosure assembly and a container to be lifted by the enclosure assembly.

It will be appreciated that although in the embodiment described above the tongues extend generally outwards of the assembly, a modified  
15 embodiment may comprise tongues or protrusions which extend generally inwardly of the assembly.

With reference to Figure 16 there is shown a further embodiment 20 of an enclosure assembly in accordance with the invention. The enclosure assembly 20 is of oblong-rectangular shape and comprises two end walls  
20 21 and two side walls 22. Each of the walls 21 and 22 is provided with elongate apertures 25 for venting.

The lower margin of the assembly 20 comprises two resilient tongues 24, one on each side wall 22, and sixteen locating tabs 26.

Each side wall 22 is provided with a pair of tabs 26 on each side of the  
25 tongue 24, each pair of tabs 26 of each side wall 22 being spaced in the

direction of the thickness of the side wall. Similarly, each end wall 21 comprises four locating tabs 26. The two innermost tabs on each end wall being spaced from the two outermost tabs in the direction of the thickness of the wall.

- 5 Each tongue 24 comprises an inwardly extending protrusion 28. A notch feature 27 is provided in the wall 22 on each side of the tongue 24 to enhance the resilience of the tongue laterally of the enclosure assembly 20.

- 10 The uppermost margin of the assembly 20 comprises two handles 29 and sixteen tab receiving recesses 30. The recesses 30 are sized and arranged to receive the tabs 26 of a second enclosure assembly 20.

- 15 Figures 18 and 19 shows a handle 29 in more detail. Each handle 29 comprises four recessed portions 32 of substantially circulate outline and five substantially flat surface portions 31, three of which are interposed between the recessed portions 32. Below each handle 29 a recess 33 is provided which is sufficiently large to allow the fingers of a person to pass there through. Each handle further comprises five outer ribs 37.

- 20 With reference to Figure 20, the assembly 20 comprises four corner hinges 35 which are located at the interface between a side wall 22 and an end wall 21, and two hinges 36 which are located centrally of each end wall 21. As seen in Figure 20, the hinges 35 and 36 conveniently allow the assembly to be arranged in a collapsed condition.

- 25 Turning to Figure 21 there is shown a tray 40 for use with the enclosure assembly 20. The tray 40 comprises four walls, which walls are provided with two handles 43. The handles 43 are substantially identical

to the handles 29 of the enclosure assembly 20. The recesses 42 are sized and arranged to locate the tabs 26 of the enclosure assembly 20.

Figures 22 and 23 illustrate the use of the enclosure assembly 20, together with the tray 40 and an enclosure assembly 50. The enclosure  
5 assembly 50 is substantially identical to enclosure assembly 20, save for the fact that assembly 50 is approximately twice as high as the assembly 20.

In use the assembly 50 is initially pushed downwards into the tray 40 and in doing so the protrusions of the tongues on the lower margin contact  
10 with the outwardly facing ribs 44 of each respective handle of the tray 40. Such contact urges the tongues to deflect generally outwardly of the assembly 50. With continual downward movement the tongues of the assembly 50 negotiate the handles and, by virtue of the inherent resilience of the tongues, the tongues 'snap' into a attached condition.  
15 Furthermore, in such an attached condition the tabs of assembly 50 are located in respective recesses 42 of the tray 40. The assembly 50 is thus attached to the tray 40, and encloses a region thereabove.

Similarly, the assembly 20 is then pushed downwards onto the upper margin of the assembly 50, so that the protrusions 28 of the assembly 20  
20 contact with the ribs 54 and then snap into position under the respective handles 52 of assembly 50, and the tabs 26 being located by the respective recesses on the upper margin of the assembly 50.

As can be seen in figure 23, in the attached condition of the assembly 50 the protrusion 28 of the tongue 24 is located under the handle 52 and said  
25 protrusion bears against flat surface portions 53 of the handle 52.

Advantageously, enclosure assemblies of different heights can be manufactured, but, importantly, comprising co-operable attachment means, which offer to a user an increased number of possible stack height configurations.

- 5 Although specific reference has been made to a stack comprising only two enclosure assemblies it will be appreciated that a stack of three or more enclosure assemblies is possible depending on the height of the goods to be transported.

- 10 Since both of the above described embodiments are collapsible to a substantially flat condition the assemblies can be readily stowed.

- 15 It will be appreciated that in all of the embodiments hereinbefore described the co-operation between the attachment means of an upper enclosure assembly and the attachment means of a lower adjacent enclosure assembly or a lower adjacent container or tray is sufficient to suspend that lower assembly or container or tray when the upper enclosure assembly is lifted. The co-operation is desirably sufficient so that a stack of multiple enclosure assemblies and a container or tray (with the goods therein) can be lifted from one of the enclosure assemblies of the stack.

## CLAIMS

1. An enclosure assembly (1) which is adapted to be supported on a container (2) and in situ the enclosure assembly encloses a region above the container, said enclosure assembly comprising co-operable attachment  
5 means (3,7), the arrangement of the enclosure assembly being such that in use the attachment means of a first enclosure assembly which is supported on a container is engaged with the attachment means of a second enclosure assembly, said enclosure assemblies forming a stack in which the second enclosure assembly encloses a region above the first  
10 enclosure assembly.
2. An enclosure assembly (1) as claimed in claim 1 in which the enclosure assembly is of substantially tubular form and the distal ends of which are open.
3. An enclosure assembly (1) as claimed in claim 1 or claim 2 in which  
15 the attachment means comprises first attachment means (3) and second attachment means (7), the first attachment means being spaced from the second attachment means in the direction of the height of the enclosure assembly.
4. An enclosure assembly (1) as claimed in claim 3 in which the first  
20 attachment means (3) and the second attachment means (7) are located towards respective distal ends of the enclosure assembly.
5. An enclosure assembly (1) as claimed in claim 4 in which the first attachment means (3) is located towards a lowermost margin of the enclosure assembly and the second attachment means (7) is located  
25 towards an uppermost margin of the enclosure assembly.

6. An enclosure assembly (1) as claimed in any preceding claim in which the first attachment means (3) of one enclosure assembly is adapted to be engaged with the second attachment means (7) of another assembly.

5 7. An enclosure assembly (1) as claimed in claim 6 in which engagement between the first attachment means (3) and the second attachment means (7) is by way of a male-to-female engagement.

8. An enclosure assembly (1) as claimed in any of claims 3 to 7 in which the first attachment means (3) is adapted to engage with a  
10 container (2) so that the enclosure assembly is secured to the container to enclose a region above said container.

9. An enclosure assembly (1) as claimed in any of claims 3 to 8 in which the first attachment means (3) comprises protrusion means (3).

10. An enclosure assembly (1) as claimed in claim 9 in which the  
15 protrusion means (3) comprises a portion which extends generally laterally of the enclosure assembly and which portion is adapted to be received by complementary protrusion receiving means (7,8).

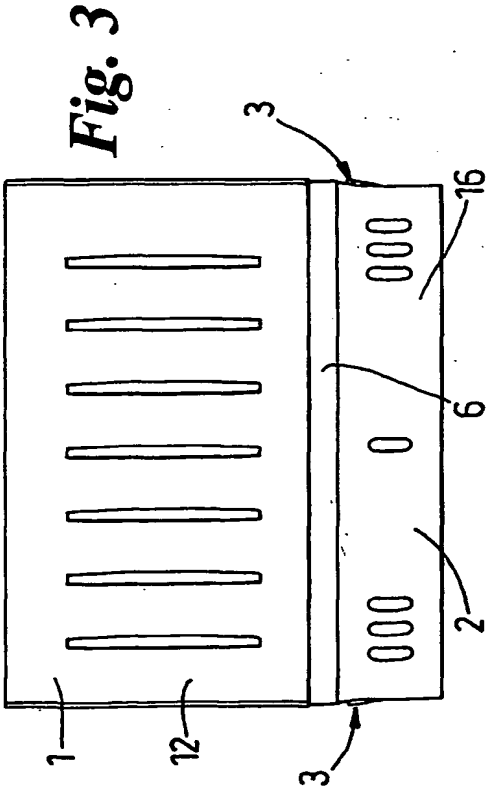
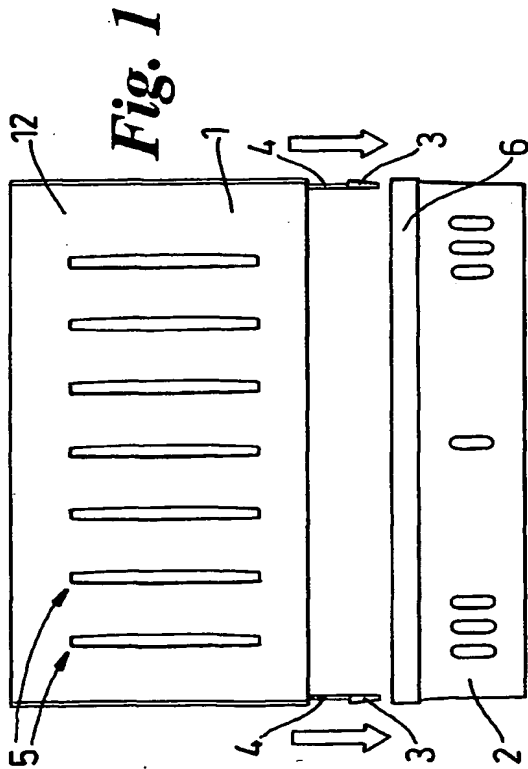
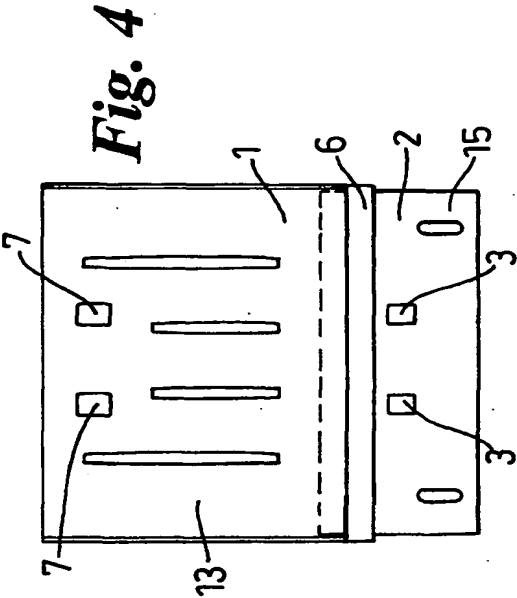
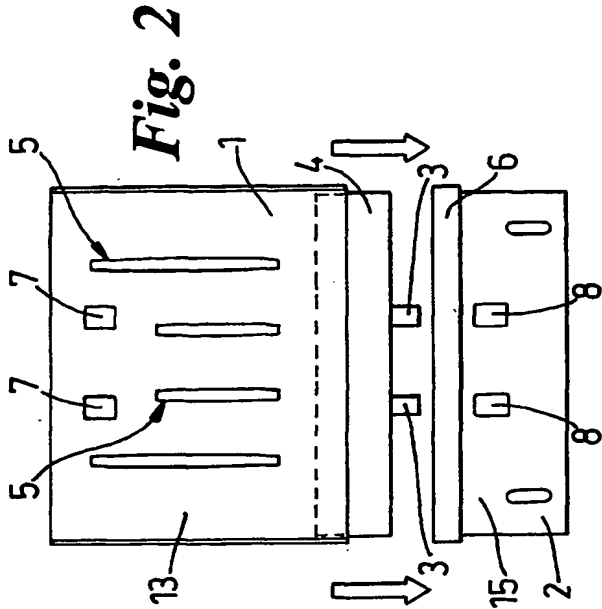
11. An enclosure assembly (1) as claimed in claim 10 in which the protrusion means (3) is of a tapered profile.

20 12. An enclosure assembly (1) as claimed in claim 11 in which the tapered profile widens laterally of the enclosure assembly with increasing height of the enclosure assembly.



13. An enclosure assembly (1) as claimed in any of claims 9-12 in which the protrusion means (3) is provided secured to a resilient portion (4).
14. An enclosure assembly (1) as claimed in claim 13 in which the  
5 resilient portion (4) extends generally downwards of the enclosure assembly.
15. An enclosure assembly (1) as claimed in claim 14 in which the resilient portion (4) is adapted to be deflectable in a direction which is generally lateral of the enclosure assembly.
- 10 16. An enclosure assembly (1) as claimed in any of claims 9 to 15 which is of oblong-rectangular shape, protrusion means (3) are provided on opposite sides of the enclosure assembly.
- 15 17. An enclosure assembly (1) as claimed in any claims 3 to 16 in which the second attachment means comprises protrusion receiving means (7).
18. An enclosure assembly (1) as claimed in any of claims 3 to 17 in which the first attachment means (3) comprises enclosure assembly attachment means and container attachment means, the enclosure assembly attachment means being physically distinct from the container  
20 attachment means.
19. A method of assembling transportation packaging comprising attaching a first enclosure assembly (1a) onto a container (2) by way of engagement between first attachment means (3a) of the first enclosure assembly and the container such that the first enclosure assembly  
25 encloses a region above the container, and attaching a second enclosure

assembly (16) to the first enclosure assembly by way of engagement between first attachment means (3b) of the second assembly and second attachment means (7a) of the first enclosure assembly such that the second enclosure assembly encloses a region above the first enclosure assembly, each enclosure assembly being of substantially tubular form and the distal ends of the first assembly, and that distal end of the second enclosure assembly which, in situ, is adjacent to a distal end of the first enclosure assembly, being open.



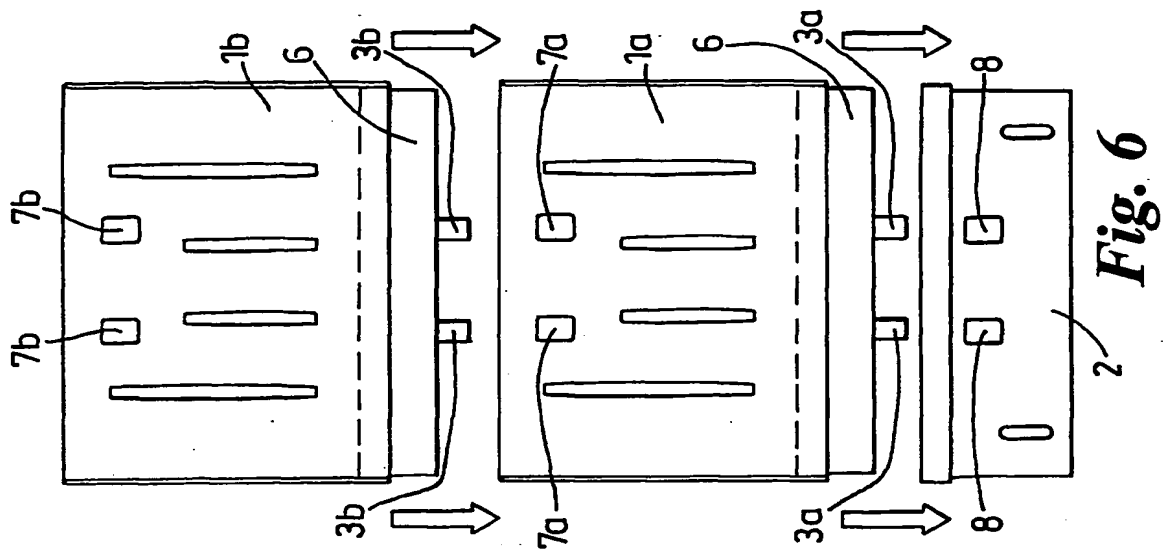


Fig. 6

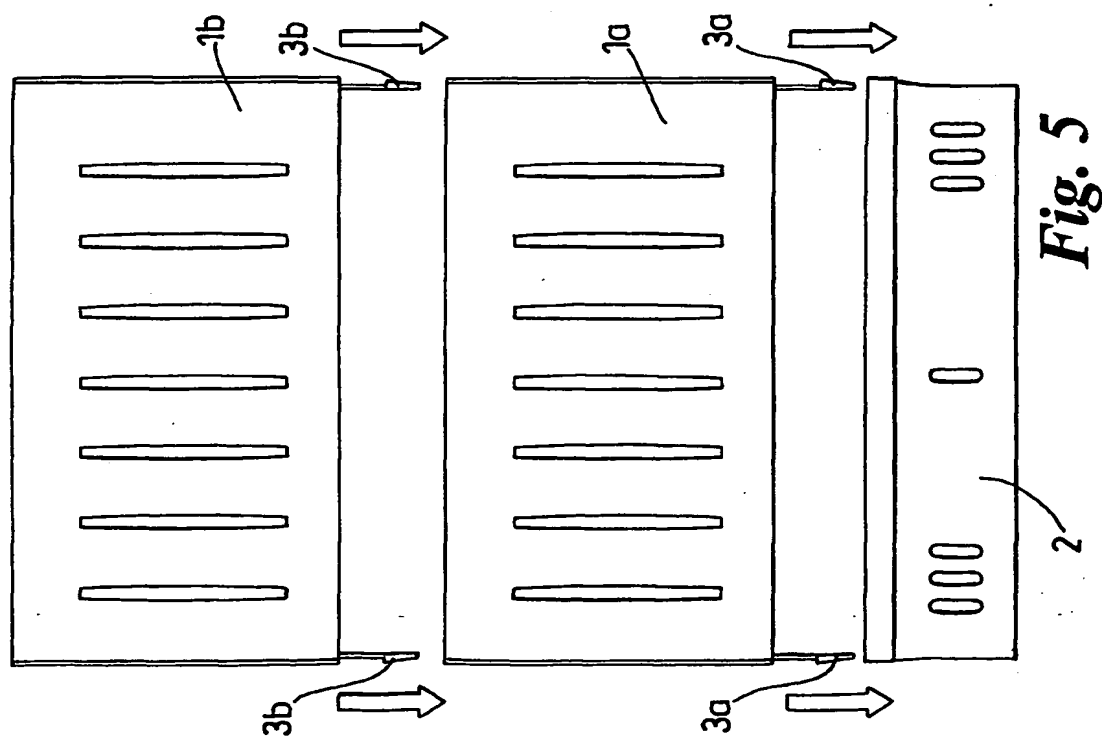
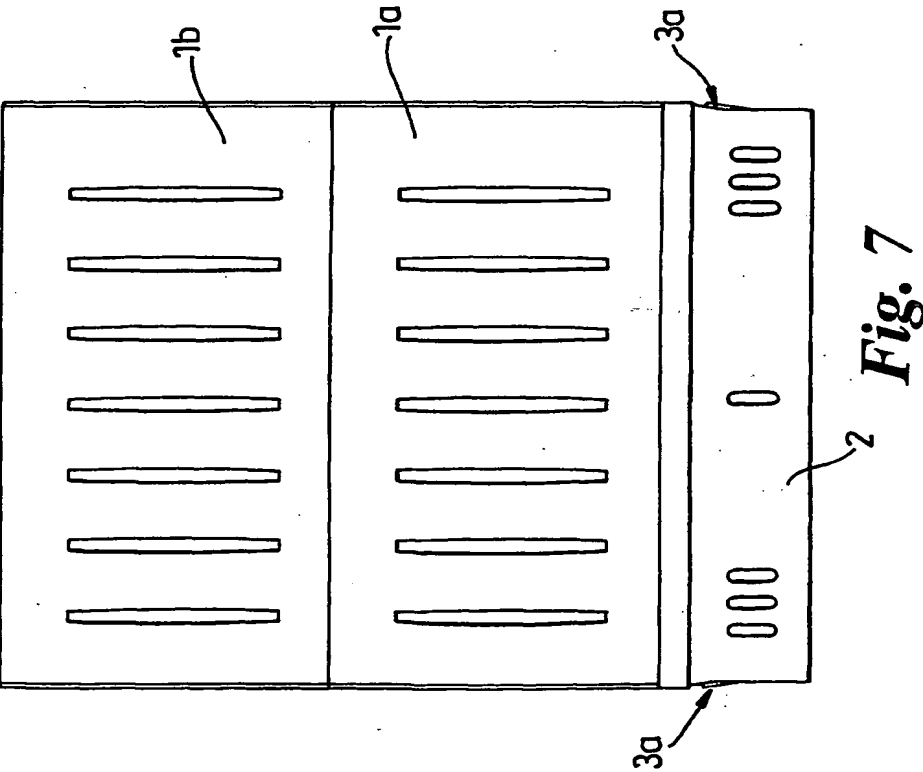
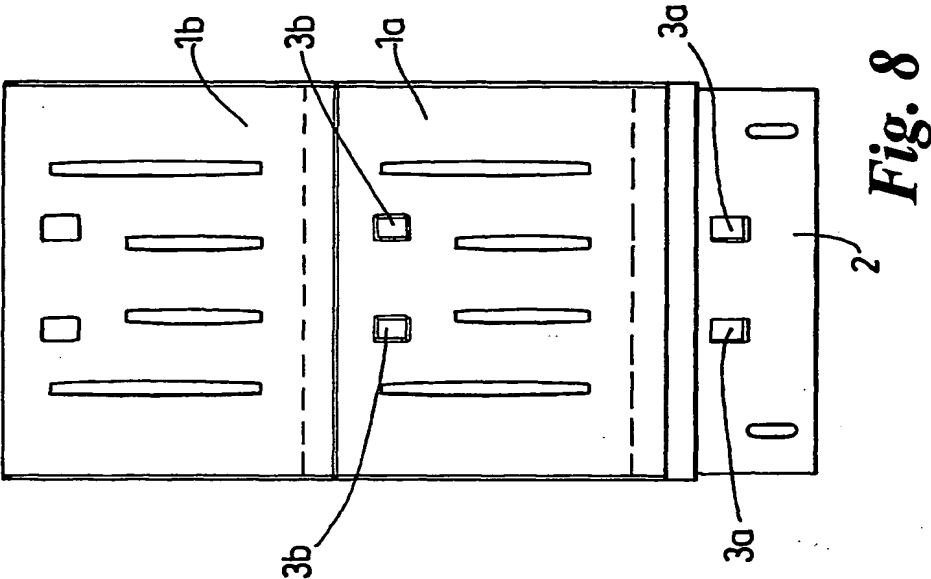


Fig. 5



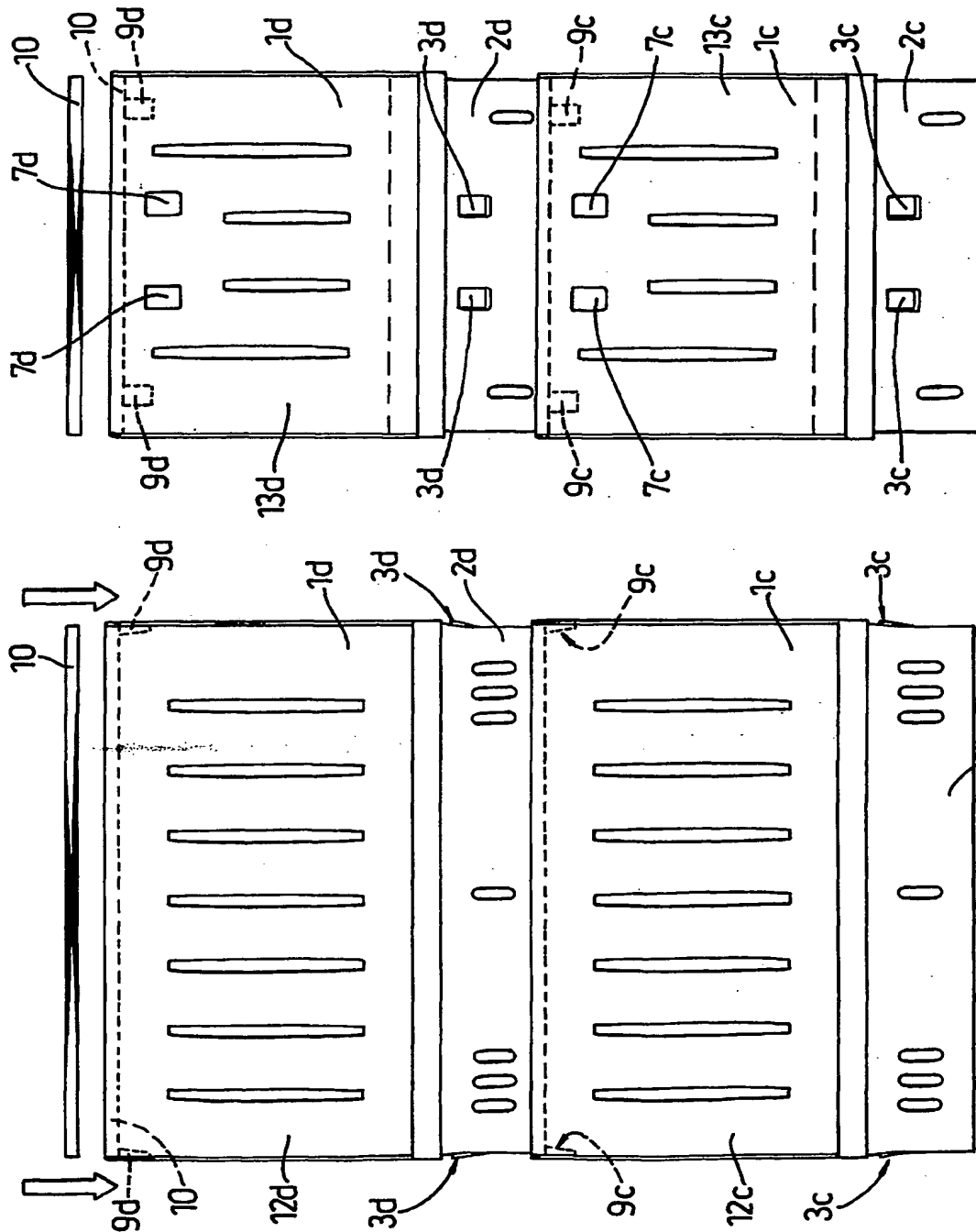
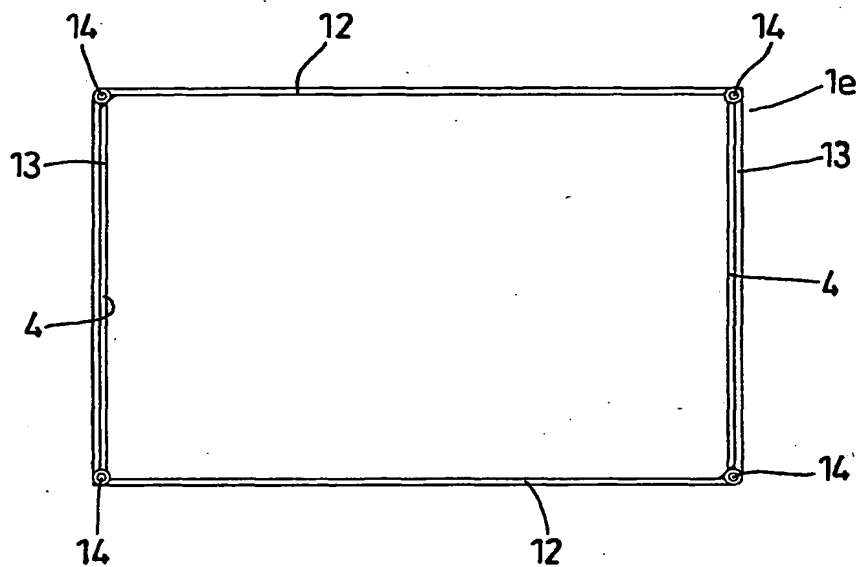


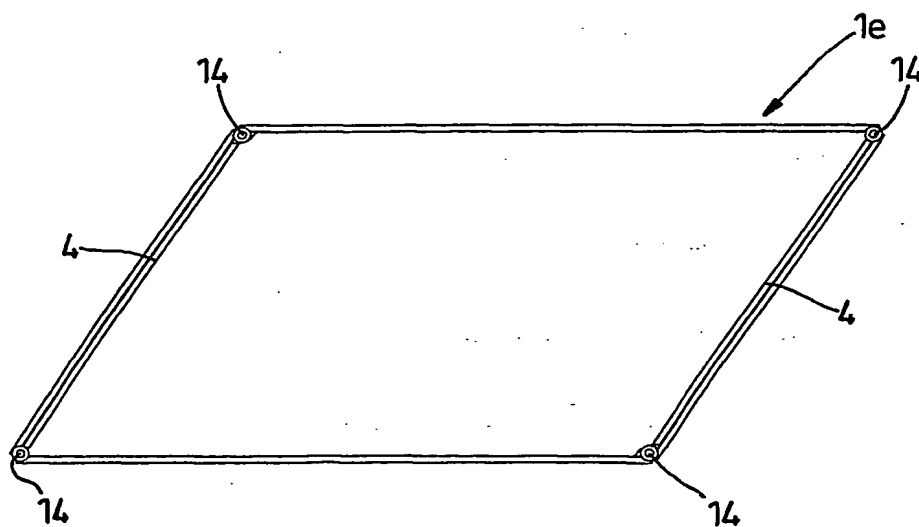
Fig. 10

Fig. 9

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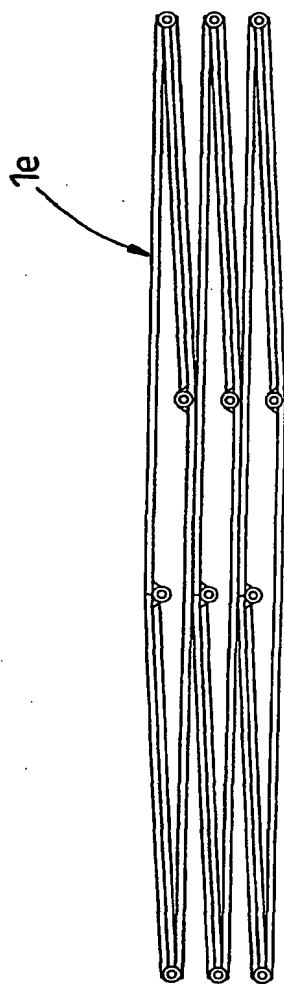


**Fig. 11**



**Fig. 12**

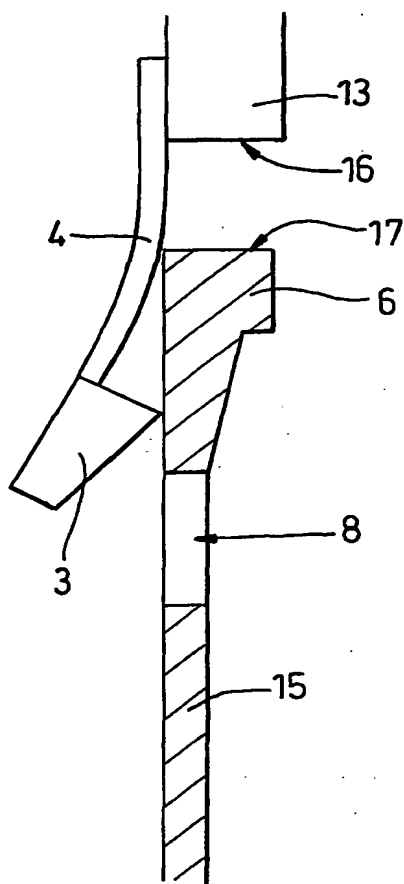
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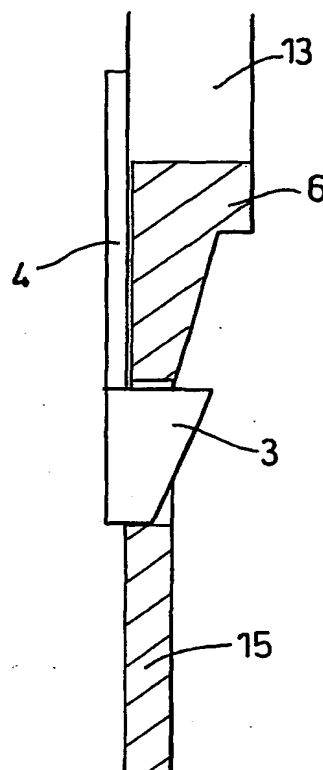
*Fig. 13*



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**Fig. 14**



**Fig. 15**

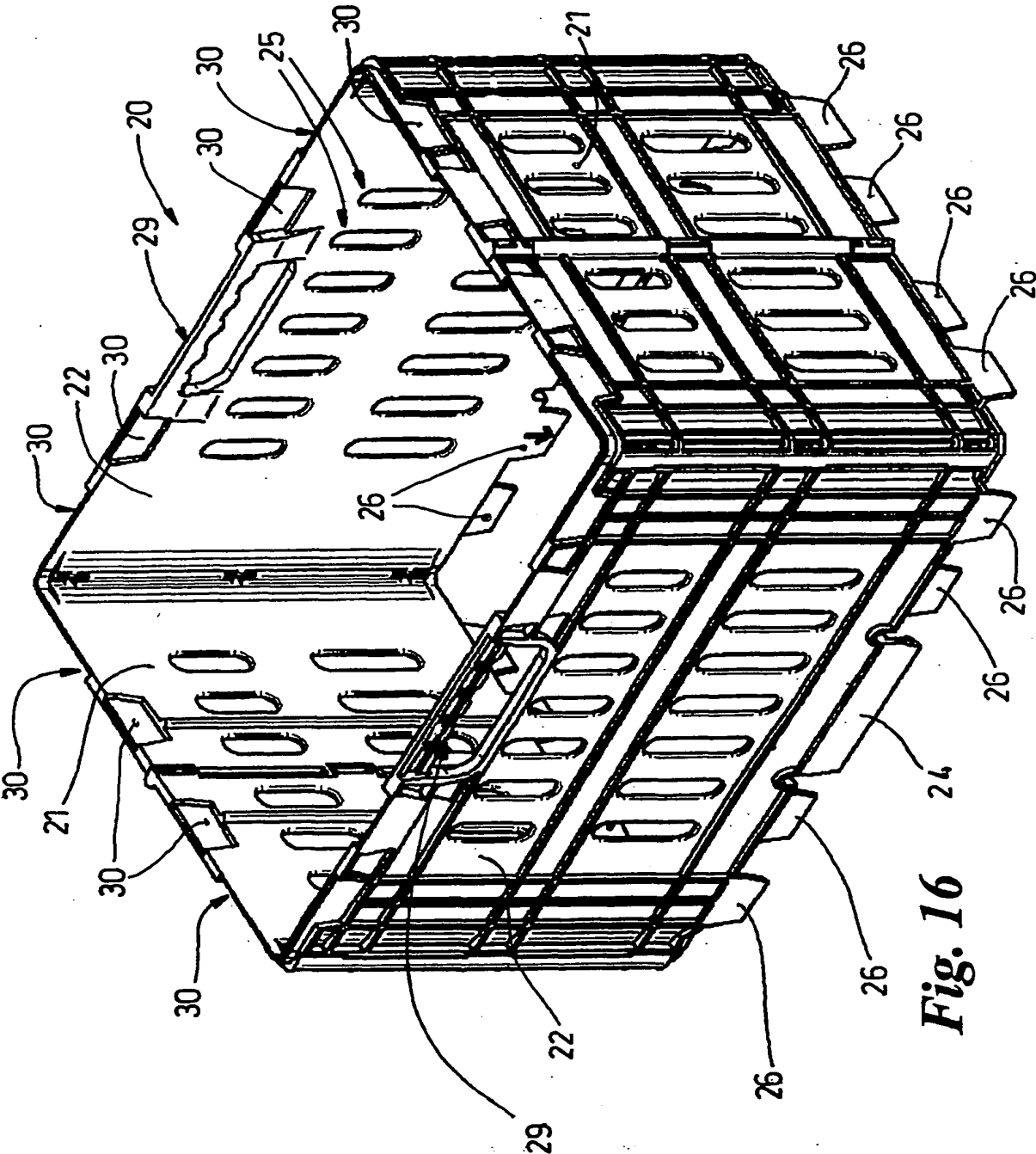


Fig. 16

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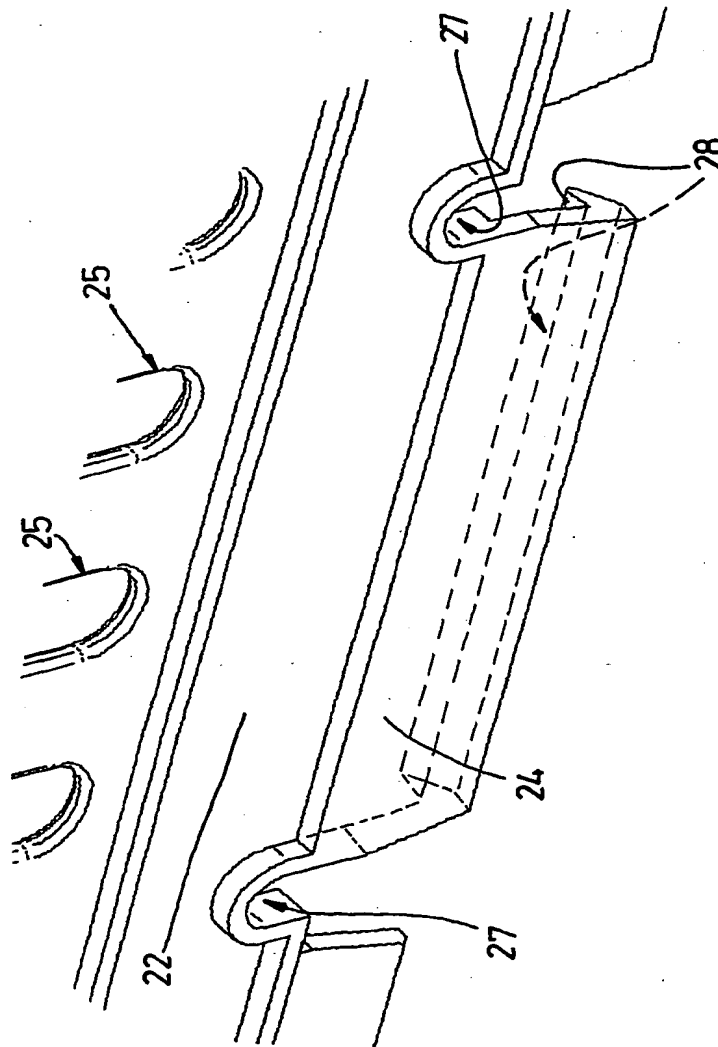
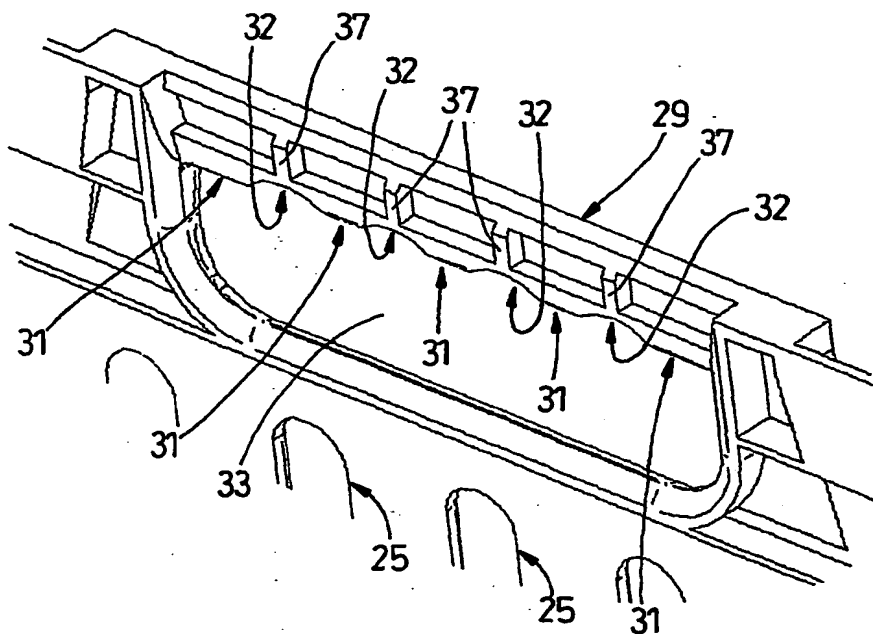


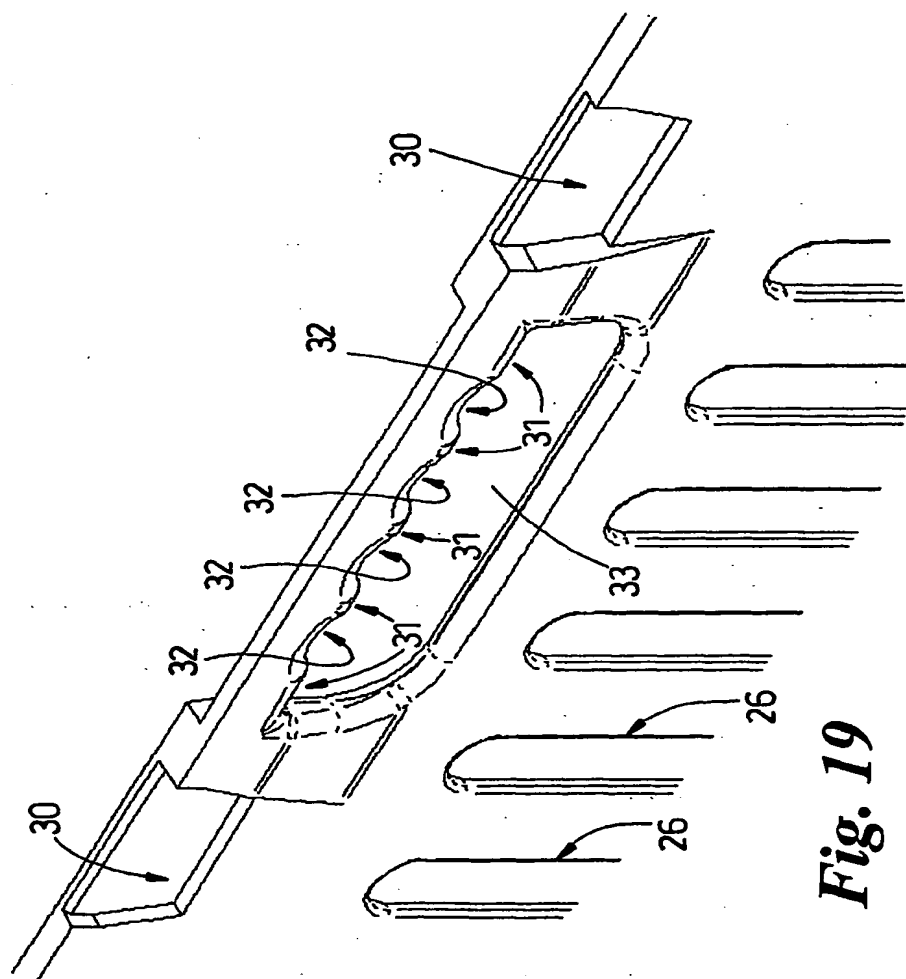
Fig. 17

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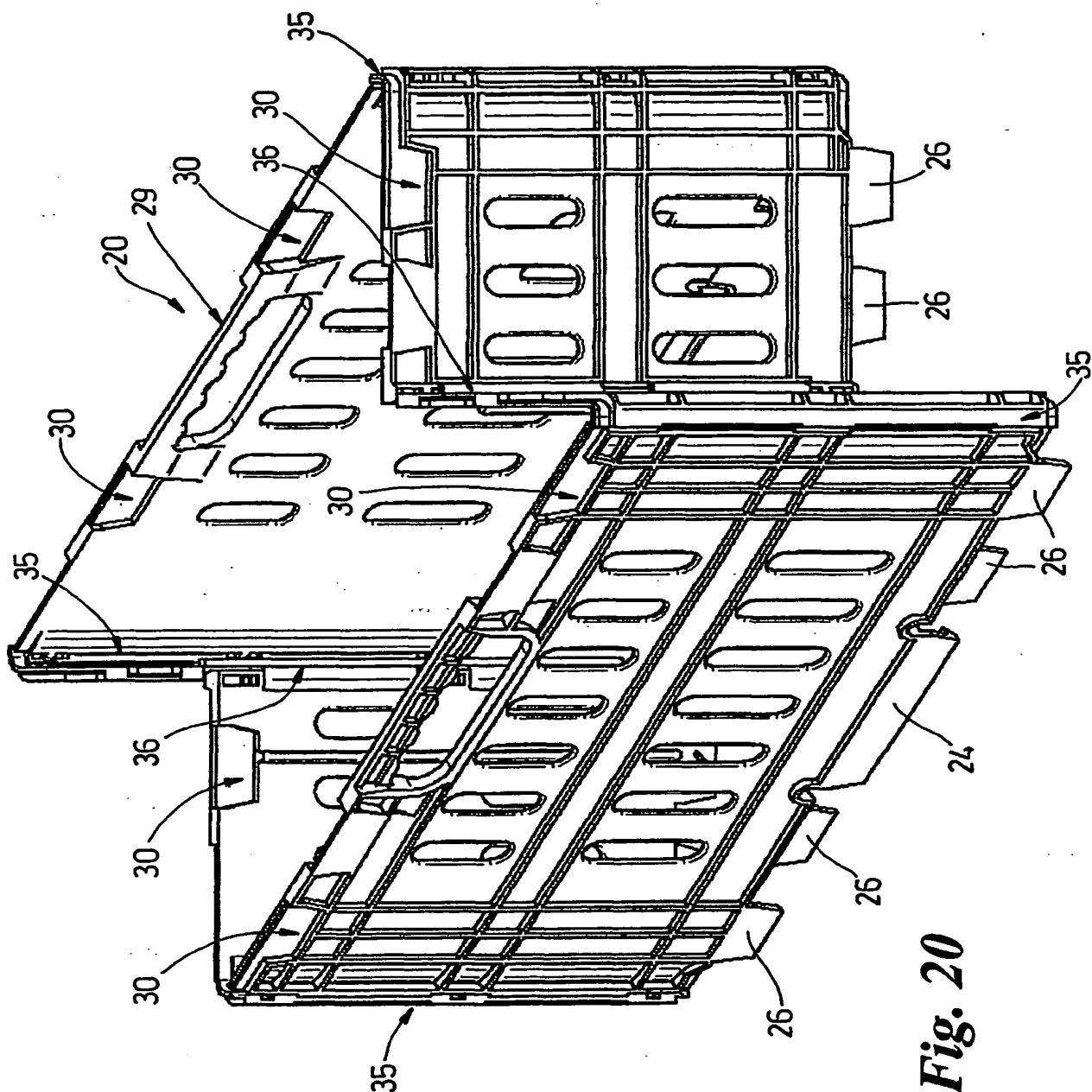
**Fig. 18**

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**Fig. 19**

12/15



**Fig. 20**

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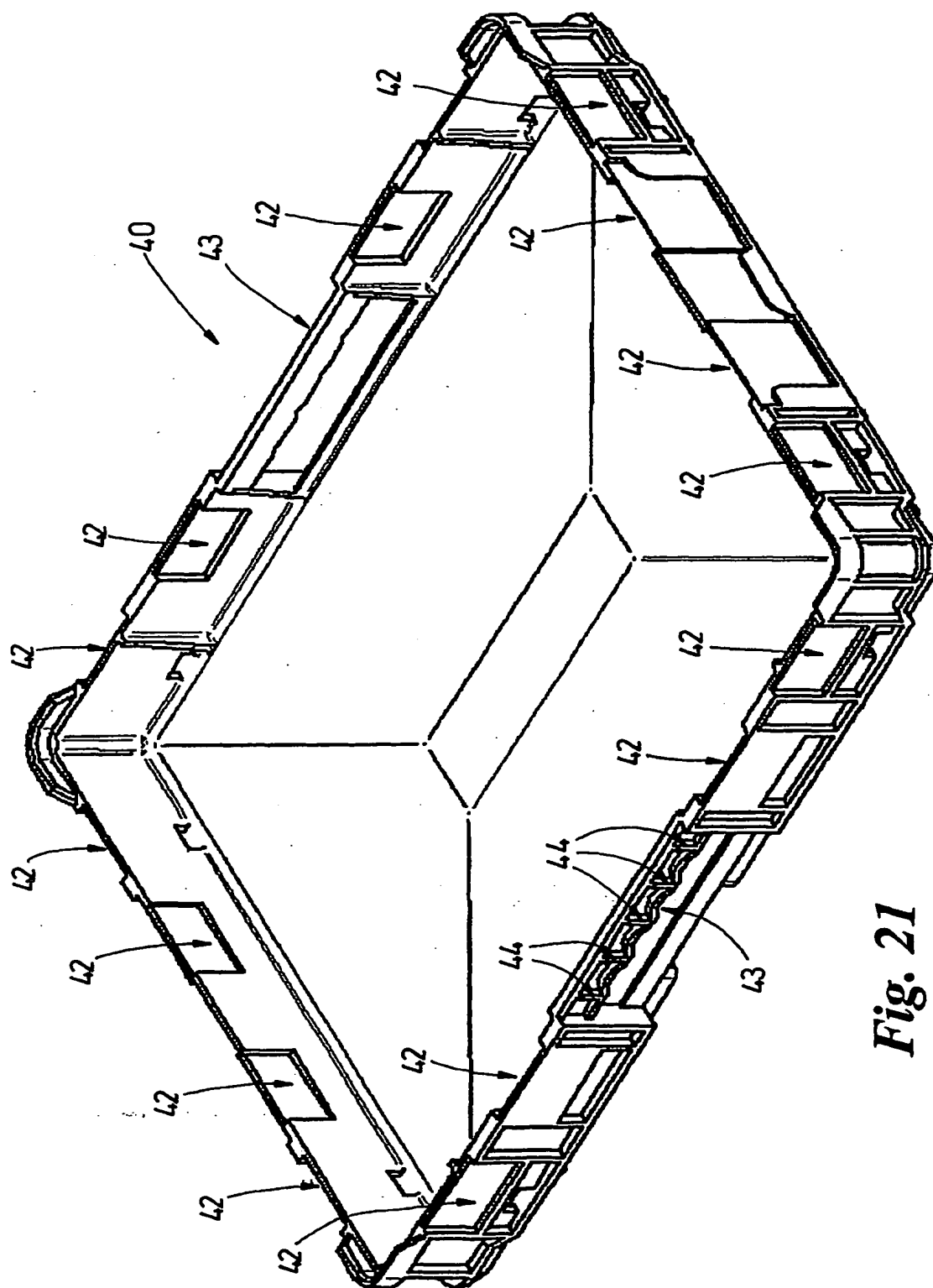
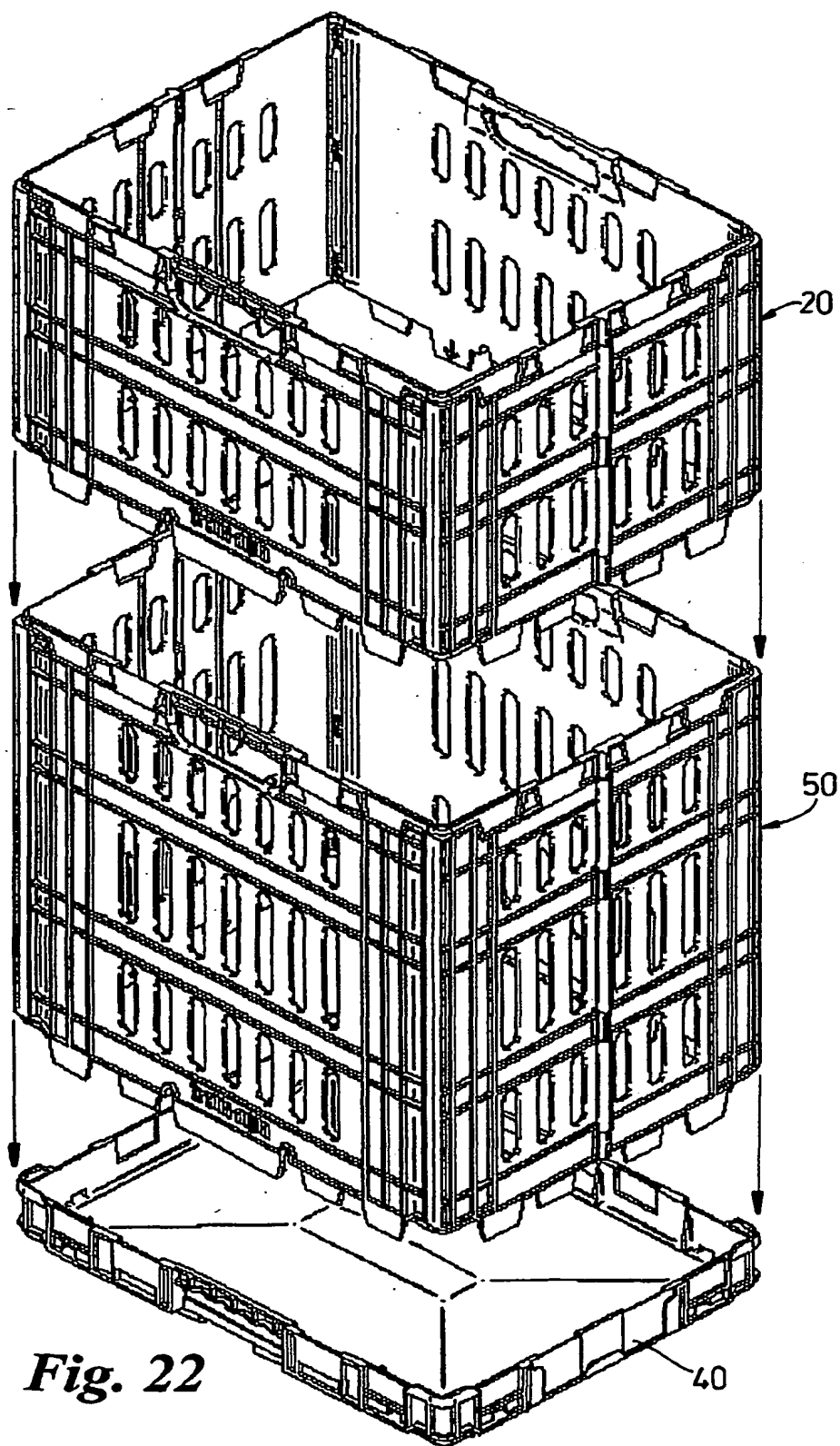


Fig. 21

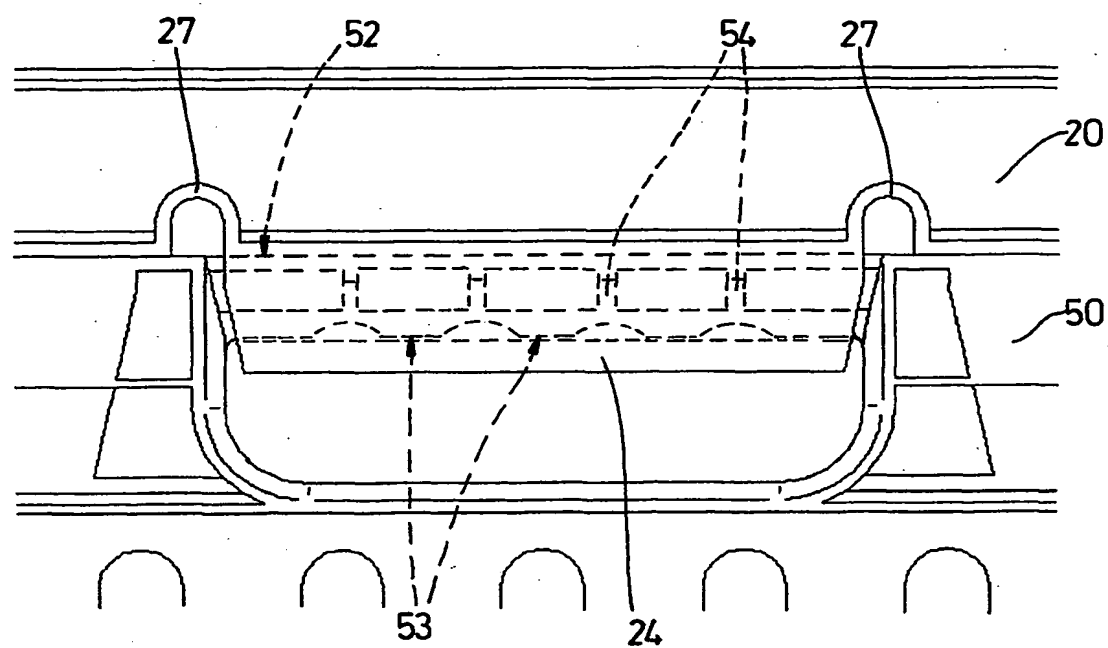
14/15



**Fig. 22**



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**Fig. 23**

## INTERNATIONAL SEARCH REPORT

PCT/GB 02/02569

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 B65D21/08

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 40 37 696 A (SCHOELLER PLAST AG) 30 April 1992 (1992-04-30)	1-9, 16-19
Y	column 4, line 7 - line 9; figure 8 column 5, line 4 - line 7; figure 12	10-15
Y	NL 9 300 986 A (WAVIN BV) 2 January 1995 (1995-01-02) figures 1,3	10-15
A	GB 1 117 448 A (KEARNEY PERSN SERVICES A T) 19 June 1968 (1968-06-19) page 4, line 121 - line 122; figures 6,7 page 5, line 95 - line 99	18
P,X	FR 2 805 528 A (KRUSTANORD) 31 August 2001 (2001-08-31) figure 2	1-9, 16-19

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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